

# MATHEMATICS

## Fifth Grade

### NUMBER AND OPERATIONS

*The student will identify, represent, order, and compare numbers; and estimate, compute, and solve problems.*

Key	Reporting Category		
A	N	Read and write numbers from millions to thousandths.	
A	N	Identify the place value of a given digit from millions to thousandths.	
A	N	Represent whole numbers and two-place decimals in expanded form.	
A	N	Represent, compare, and order whole numbers and decimals to thousandths.	
D		Order and compare (<, >, or =) whole numbers, fractions, mixed numbers, and decimals using models (e.g., number lines, base ten blocks, Venn diagrams, and hundreds boards).	
A	N	Compare and order fractions using the appropriate symbol (<, >, and =).	
D		Demonstrate knowledge and understanding of grade level mathematical terms.	
D		Represent proper fractions, improper fractions, and mixed numbers using concrete objects, pictures, and the number line.	
A	N	Connect symbolic representations of proper and improper fractions to models of proper and improper fractions.	
A	N	Represent numbers as both improper fractions and mixed numbers.	
D		Identify and change improper fractions to mixed numbers and vice versa.	
A	N	Generate equivalent forms of commonly used fractions, decimals, and percents (e.g., 1/10, 1/4, 1/2, .75, 50%).	
D		Recognize relationships among commonly used fractions and decimals.	
A	C	Multiply a fraction by a multiple of its denominator (denominator less than or equal to 10).	
M		Use commutative, associative, and identity properties.	
D		Explain and demonstrate the inverse nature of addition and subtraction.	
D		Explain and demonstrate the inverse nature of multiplication and division.	
D		Explain how addition, subtraction, multiplication, and division affect the size and order of numbers.	
D		Select appropriate methods and tools for computations (e.g., mental computation, estimation, calculators, and paper and pencil).	I'm Thirsty, p.W134 Lobster in Your Lunch Box, p.W245 Checks and Balances, p.W387
I		Explain why one form of a number might be more useful for computation than another form.	
A	N	Use estimation to determine a reasonable solution to a whole number computation.	
A	C	Add, subtract, multiply, and divide whole numbers (multipliers and divisors no more than two-digits).	
A	C	Add, subtract, and multiply decimals.	

#### KEY

I = Introduced D = Developing A = State Assessed M = Mastered

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<b>A</b>	<b>C</b>	Add and subtract commonly used fractions.	
<b>D</b>		Identify missing information and/or too much information in real-world problems.	
<b>A</b>	<b>R</b>	Solve one- or two-step real-world problems involving addition, subtraction, and/or multiplication of whole numbers and decimals.	
<b>D</b>		Solve real-world problems using decimals (including money), fractions, and percents.	How Wet Is Our Planet?, p.AW121 What's in the Air?, p.AW136

## ALGEBRA

*The student will analyze and use symbols to generalize patterns, use properties of operations, and analyze change in various situations.*

<b>D</b>		Generalize and extend or complete patterns involving geometric figures or numbers.	
<b>A</b>	<b>AT</b>	Extend numerical patterns.	
<b>A</b>	<b>AT</b>	Extend geometric patterns.	
<b>A</b>	<b>AT</b>	Generalize numerical patterns using a variable.	
<b>D</b>		Represent and analyze patterns and functions using words, tables, and graphs.	
<b>D</b>		Determine or apply a function rule involving data in a function table.	
<b>A</b>	<b>AT</b>	Apply basic function rules.	
<b>M</b>		Demonstrate understanding that an equation is a number sentence stating two quantities are equal.	
<b>A</b>	<b>AT</b>	Solve open sentences involving addition, subtraction, multiplication, and division.	Bird Olympics, p.FW187
<b>A</b>	<b>AT</b>	Connect open sentences to real-world situations.	
<b>D</b>		Represent the idea of a variable as an unknown quantity using a letter or a symbol.	
<b>A</b>	<b>AT</b>	Select an equation that represents a given mathematical relationship.	
<b>M</b>		Apply commutative, associative, zero, distributive, and identity properties.	
<b>M</b>		Show that division is not commutative.	
<b>D</b>		Investigate how a change in one variable relates to a change in a second variable.	Bird Olympics, p.FW187
<b>D</b>		Use methods to compare and describe situations involving constant and/or varying rates of change and to solve real-world problems (e.g., extending rate charts).	
<b>A</b>	<b>R</b>	Extend rate charts to solve real-world problems.	

## GEOMETRY

*The student will analyze and describe characteristics and properties of 2- and 3-dimensional shapes, locate and specify points on a grid, and use geometric concepts (e.g., symmetry and transformations) and reasoning to solve problems.*

<b>D</b>		Identify, compare, and analyze attributes of two- and three-dimensional figures.	Spider Web Geometry, p.W34
<b>A</b>	<b>G</b>	Identify lines of symmetry in two-dimensional geometric figures.	
<b>A</b>	<b>G</b>	Identify two- or three- dimensional shapes given defining attributes.	
<b>D</b>		Use the attributes of geometric figures to develop definitions of the figures.	

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<b>A</b>	<b>G</b>	Identify lines, line segments, rays, and angles.	
<b>D</b>		Identify and draw points, lines, line segments, rays, and angles.	
<b>D</b>		Draw circles and label diameter, circumference, radius, and center.	
<b>A</b>	<b>G</b>	Classify geometric figures using properties.	
<b>D</b>		Investigate and describe the results of subdividing and combining geometric figures.	Watershed, p.AW132
<b>D</b>		Recognize, name, compare, and contrast congruent and symmetrical geometric figures.	
<b>D</b>		Describe the relationships between lines and the characteristics of angles (e.g., parallel, perpendicular, intersecting, right, acute, obtuse, and straight).	
<b>I</b>		Make and test hypothesis about geometric properties.	
<b>I</b>		Explore similarity and how the sides and angles of similar triangles are related.	
<b>D</b>		Describe location and movement using appropriate mathematical language.	
<b>A</b>	<b>AT</b>	Locate and specify a point in Quadrant I of a coordinate system.	
<b>D</b>		Identify, predict, and describe the results of transformations of two-dimensional figures (i.e., slides, flips, and turns).	
<b>A</b>	<b>G</b>	Use spatial reasoning to predict the result of sliding, flipping, or turning a two-dimensional shape.	
<b>I</b>		Describe and identify line and rotational symmetry in two-dimensional figures.	
<b>D</b>		Describe a motion or a series of motions that will show that two shapes are congruent.	
<b>D</b>		Construct and draw two- and three-dimensional geometric figures.	
<b>D</b>		Create and describe mental images of objects, patterns, and paths.	
<b>D</b>		Recognize and build a 3-dimensional object from a 2-dimensional representation (net) of that object (e.g., cube, rectangular prism, pyramid, cone, or cylinder).	
<b>A</b>	<b>G</b>	Use spatial reasoning to identify the three-dimensional figure created from a two-dimensional representation (net) of that figure (i.e., cube, rectangular prism, pyramid, cone, or cylinder).	
<b>I</b>		Use visualization and spatial reasoning (e.g., geometric models) to solve problems.	

## MEASUREMENT

*The student will determine time, length, perimeter, area, weight, capacity, and temperature and solve real-world problems involving measurement.*

<b>D</b>		Demonstrate understanding of the concepts of length, perimeter, circumference, area, weight, capacity, volume, elapsed time, and angle measure.	Where Does Water Run? , p.AW21 Puddle Wonders! , p.AW114 Watershed, p.AW132
<b>D</b>		Demonstrate understanding that measurements are approximations.	Bird Olympics, p.FW187
<b>I</b>		Understand how differences in units affect precision of measurements.	
<b>D</b>		Demonstrate understanding of the relationships among the units within both customary and metric systems of measurement.	How Wet is Our Planet? (variation) AW121
<b>A</b>	<b>ME</b>	Connect simple units of measurement within the same system of measurement.	
<b>A</b>	<b>ME</b>	Use estimation to determine if a length or volume measurement is reasonable.	

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<b>A</b>	<b>ME</b>	Select appropriate standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.	Where Does Water Run? , p.AW21 Puddle Wonders! , p.AW114 Watershed, p.AW132
<b>D</b>		Explore what happens to measurements of a two-dimensional shape when the shape is changed in some way (e.g., perimeter, area).	
<b>A</b>	<b>ME</b>	Use strategies to estimate perimeter and area of rectangles.	
<b>D</b>		Select and use appropriate standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.	Where Does Water Run? , p.AW21 Puddle Wonders! , p.AW114 Watershed, p.AW132
<b>D</b>		Select and use appropriate tools for measuring in real-world situations.	
<b>A</b>	<b>ME</b>	Use a ruler to measure to the nearest centimeter and $\frac{1}{4}$ inch.	
<b>A</b>	<b>R</b>	Solve real-world problems involving addition and subtraction of measurements.	
<b>A</b>	<b>R</b>	Solve real-world problems involving perimeter and area of rectangles.	
<b>A</b>	<b>R</b>	Solve real-world problems involving elapsed time.	
<b>A</b>	<b>ME</b>	Read temperatures on a thermometer using Fahrenheit and Celsius scales.	
<b>A</b>	<b>ME</b>	Apply formulas to find the area of parallelograms and triangles.	
<b>D</b>		Explain and demonstrate how scale in maps and drawings shows relative size and distance.	Whale of a Tail, p.AW10
<b>I</b>		Develop informal strategies to determine the surface area and volume of rectangular solids.	

#### DATA ANALYSIS AND PROBABILITY

*The student will collect, organize, analyze, interpret, and display data in tables and graphs and determine the probabilities of outcomes in simple experiments.*

<b>D</b>		Collect data using observations, surveys, and experiments.	Busy Bird Motel, p.FW99 Hidden Hazards, p.FW105 Bird Olympics, p.FW187
<b>D</b>		Understand how data-collection methods could affect the results.	Busy Bird Motel, p.FW99
<b>A</b>	<b>DP</b>	Represent and interpret data in bar graphs and pictographs.	Net Gain, Net Effect, p.AW85 What's in the Water?, p.AW140
<b>D</b>		Represent data using pictographs, bar graphs, tables, circle graphs, and line graphs.	Bearly Growing, p.W19 Oh Deer! , p.W36 Hidden Hazards, p.FW105
<b>D</b>		Interpret data displayed in pictographs, bar graphs, tables, circle graphs, and line graphs.	Bearly Growing, p.W19 Oh Deer! , p.W36 Bird Olympics, p.FW187
<b>D</b>		Use measures of central tendency (i.e., mean, median, and mode).	
<b>A</b>	<b>DP</b>	Determine the mean, median, and mode of a data set.	
<b>I</b>		Find the range of a data set.	
<b>D</b>		Make predictions and justify conclusions based on data.	
<b>A</b>	<b>AT</b>	Make predictions based on data.	
<b>D</b>		Design investigations to address a question.	Water's Going On?, p.AW149

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			Alice in Waterland, p.AW151
<b>D</b>		Examine various graphical representations of data to evaluate how accurately the data is depicted.	
<b>I</b>		Explain the importance of sample size in investigations.	
<b>D</b>		Describe the likelihood or chance of events as likely, unlikely, certain, equally likely, or impossible.	
<b>A</b>	<b>DP</b>	Determine the most likely, least likely, or equally likely outcomes in simple experiments.	
<b>D</b>		Use a sample space to predict the probability of an event.	
<b>A</b>	<b>DP</b>	Represent the likelihood of an event using a fractional number from zero to one.	

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